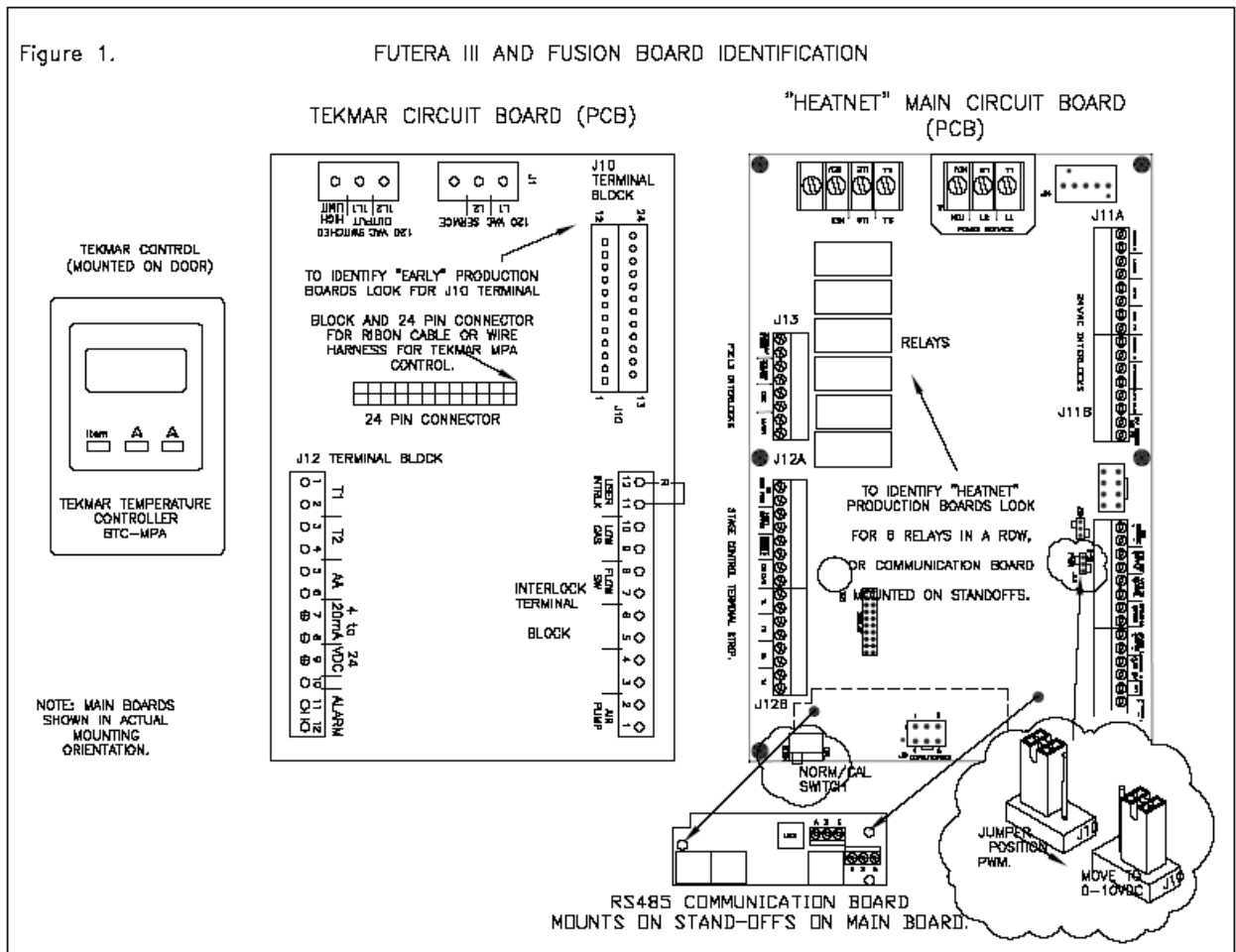


Variable Frequency Drive (VFD) (KB Electronics to AC Tech) Field Conversion Kit With HeatNet Control # 3321-1002

INTRODUCTION: This instruction describes the procedure to replace Variable Frequency Drive (VFD) from KB Electronics to AC Tech on Futera III Series with Heat-Net Control platform. This instruction applies to Futera III and Futera Fusion model 500-2000 MBH.

Please refer to *Figure 1* to identify the control platform:

Figure 1. Control Platforms



PARTS: Futera III Series with Heat-Net Control platform will require field retrofit kit 3321-1002 which includes all the parts listed in *Table 1*.

Table 1. Parts List

Part #	Description	Qty
15-0231	VFD AC Tech SM010S-523 1 HP, 120V	1
48-0619	Fuse 20A 600V Bussmann KTK-20	1
48-0640	Fuse Block 30A, 600V, 1 Pole BM6031B	1
16-0032	Ferrite Core 6.55mm dia.	1
40-0131	Wire Harness VFD to Blower	1
44-0015	14 ga. Black Wire	5 ft
44-0016	14 ga. White Wire	5 ft
48-0074	Spade Terminal	4
42-0509.1	Wiring Diagram	1
82-0320	Field Conversion Instruction Sheet	1

PROCEDURE:

WARNING: Disconnect all power sources to boiler before performing any electrical connections. Label each wire to be serviced before disconnecting. Wiring errors can cause improper or dangerous boiler operation. Confirm proper operation after servicing. Close the external manual gas valve on all boilers. Failure to follow this warning could result in severe property damage, severe personal injury, or death.

Phase 1 – Wiring

1. Disconnect all electrical connections from the KB Electronic VFD. Remove the KB drive and the blower harness from the system.
2. Install the new AC Tech drive where the KB drive was previously located.
3. Connect harness 40-0131 between the AC Tech drive and the blower motor. Clamp the Ferrite Core 16-0032 firmly around the Red, White and Black wire on harness 40-0131. Do not clamp around the outer gray jacket and shield wire.
Note: For best results, choose a location that is as close to the VFD as possible.
4. Fuse & Power Wire:
Mount the fuse block 48-0640 in the control panel and install the fuses 48-0619. Connect the fuse in series between the VFD power wire (Black) and Terminal L1 on the AC Tech Drive as describe in diagram (42-0509.1). Connect the Neutral and Ground wire to the VFD.
5. Signal Wires:
Connect the signal wires to Terminal 2 and 5 on the AC Tech Drive as shown in the diagram (42-0509.1). On the main control board, ensure that J10 is jumper to use “0-10” Volt DC.

Phase 2 – Programming & Initializing the VFD

1. Turn the Power OFF at the boiler' switch.
2. Remove the Blue Jumper between Terminal 1 and 11 on the AC Tech Drive.
3. Turn the boiler ON at the boiler' switch.
4. Press the “Mode” button on the AC Tech Drive. The drive will now require a password.
5. Use the Arrow Keys on the AC Tech Drive to enter the password value of “523” then press “Mode”. The parameters of the drive will be accessible at this point.
6. Use the Arrow Keys on the AC Tech Drive to scroll to P45. Press “Mode” and use the Arrow Keys to enter the model value for P45 as listed below on *Table 2*. Press “Mode” again to save the value.
7. Use the Arrow Keys on the AC Tech Drive to scroll to P46. Press “Mode” and use the Arrow Keys to enter the table value for P46 as listed below on *Table 2*. Press “Mode” again to save the value.
8. Turn the boiler OFF and reinstall the jumper wire between Terminal 1 and 11 of the AC Tech VFD.

Table 2. AC Tech Minimum and Maximum Settings

Models	P45 (Minimum)	P46 (Maximum)
MB500, MW500, CB500, CW500	30	171
MB750, MW750, CB750, CW750	40	182
MB1000, MW1000, CB1000, CW1000	33	200
MB1250, MW1250, CB1250, CW1250	19	166
MB1500, MW1500, CB1500, CW1500	35	173
MB1750, MW1750, CB1750, CW1750	39.7	196
MB2000, MW2000, CB2000, CW2000	40	200

***When changing P45 & P46 and the display shows CE, change P48 from 01 to 06.**

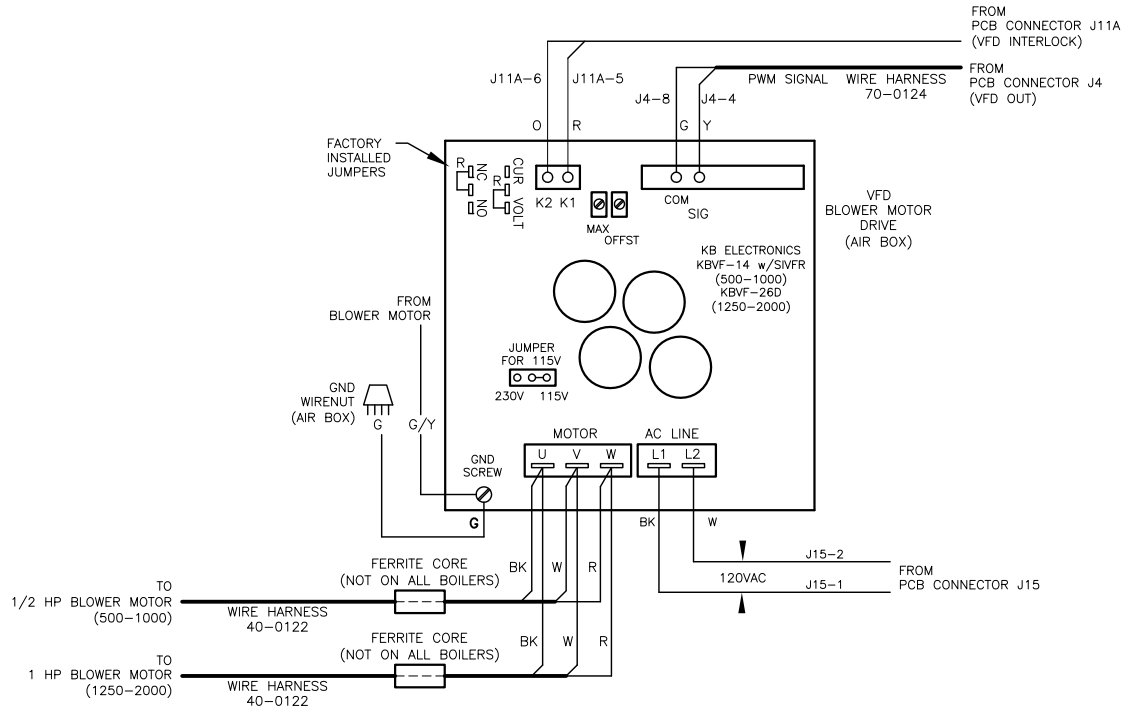
Heat Net units.

Before the boiler can be commissioned, the boiler needs to be checked for proper combustion and operation. If during this procedure it is found that normal elbow pressures and operation can not be obtained please contact the Technical Resource Department Call 413 568 9578. Inside the control panel should be a label with the combustion and elbow pressures established during the initial startup at the factory. The boiler needs to be checked to match those settings. All adjustments to obtain the correct elbow pressure should be made through the display menu in the **Calibrate Mode**. To access the Calibrate feature there is a 2-position switch on the end of the main PCB board. The switch has a CAL and NORM position and is located in the corner of the board under the small communication board. The communication board can be removed for easy access by unsnapping it from its' standoff posts. Gently pull the board to remove. These settings are accomplished as follows:

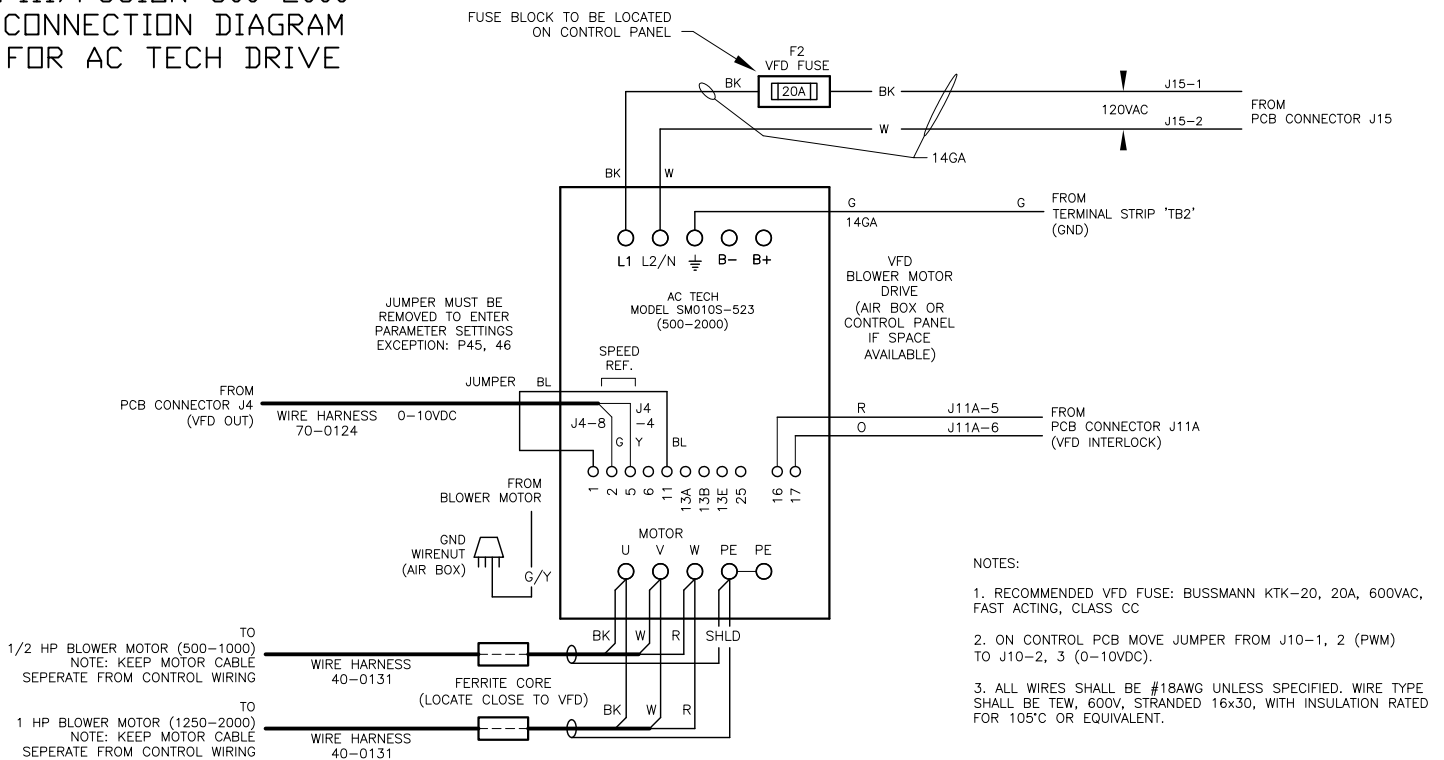
1. Connect a manometer to the elbow test port, and combustion analyzer to the flue test port.
2. Place a jumper on the T1 terminals and start the boiler. Move the selector switch to the CAL position.
3. Scroll through the menu using the UP/DOWN until it reads MINIMUM CALIBRATE. When the SELECT button is pushed the firing rate number will begin to flash and the boiler will fire to that rate. (TYP.33%). Check the elbow pressure. If adjustments are required use the UP/DOWN arrow to adjust the firing rate and elbow pressure.
4. To adjust combustion use a 2.5mm or 3/32" Allen wrench on the adjustment screw on the face of the Dung's valve. Turn the screw clockwise to increase fuel flow and the CO₂. Turn the screw counterclockwise to reduce fuel flow and CO₂.
5. Press the SELECT button to lock in the setting. Use the UP/DOWN buttons to scroll to the MAXIMUM fire menu.
6. When the SELECT button is pressed the boiler will now modulate to HI fire. The firing rate number will start to flash. (TYP. 90%). To adjust the elbow-pressure use the UP/DOWN arrows.
7. Hi fire combustion can be adjusted with the shutter on the air box orifice. If the HI fire combustion or elbow pressure needs large adjustments it is advisable to recheck the LO fire settings again.
8. Reset the selector switch to NORM and reattach the communication board. Remove the jumper on T1. Remove instruments.

HEATNET BOARDS

FIII/FUSION 500-2000 CONNECTION DIAGRAM FOR KB ELECTRONICS DRIVE



FIII/FUSION 500-2000 CONNECTION DIAGRAM FOR AC TECH DRIVE



NOTES:

1. RECOMMENDED VFD FUSE: BUSSMANN KTK-20, 20A, 600VAC, FAST ACTING, CLASS CC
2. ON CONTROL PCB MOVE JUMPER FROM J10-1, 2 (PWM) TO J10-2, 3 (0-10VDC).
3. ALL WIRES SHALL BE #18AWG UNLESS SPECIFIED. WIRE TYPE SHALL BE TEW, 600V, STRANDED 16x30, WITH INSULATION RATED FOR 105°C OR EQUIVALENT.